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CLAIMS

What is claimed is:

1. A method of coding the bit-planes of an array of numbers comprising the steps

2 of:

converting the values in the array of numbers to binary;

4 determining the number of bit-planes based on a number having the maximum
absolute value of the array of numbers;

6 generating a tree structured description of significance information for each bit-plane
of the array based on a modified quad-tree coding technique;

8 generating an SNR scalable encoding of the significance information for each bit-
plane by describing new branches and leaves of the tree corresponding to each bit-plane in a
bottom-up-depth-first manner;

generating an encoding of refinement information for each bit-plane; and

12 generating a SNR scalable description of the array by concatenating the encoding of
the significance information and the refinement information generated for each bit-plane.

2. The method according to claim 1 further comprising the step of truncating the

2 binary values to a predetermined level of accuracy after the step of converting.

3. A method of coding the bit-planes of an array of numbers, wherein the values

2 in the array of numbers have been converted to binary, the binary values have been truncated
to a predetermined level of accuracy, and the number of bit-planes has been determined based

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4 on a number having the maximum absolute value of the array of numbers, the method
comprising the steps of:

6 generating a tree structured description of significance information for each bit-plane
of the array based on a modified quad-tree coding technique;

8 generating an SNR scalable encoding of the significance information for each bit-
plane by describing new branches and leaves of the tree corresponding to each bit-plane in a
bottom-up-depth-first manner;

generating an encoding of refinement information for each bit-plane; and

12 generating a SNR scalable description of the array by concatenating the encoding of
the significance information and the refinement information generated for each bit-plane.

4. An apparatus for coding the bit-planes of an array of numbers comprising:

means for converting the values in the array of numbers to binary;

means for truncating the binary values to a predetermined level of accuracy;

4 means for determining the number of bit-planes based on a number having the
maximum absolute value of the array of numbers;

6 means for generating a tree structured description of significance information for each
bit-plane of the array based on a modified quad-tree coding technique;

8 means for generating an SNR scalable encoding of the significance information for
each bit-plane by describing new branches and leaves of the tree corresponding to each bit-
10 plane in a bottom-up-depth-first manner;

means for generating an encoding of refinement information for each bit-plane; and

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12 means for generating a SNR scalable description of the array by concatenating the
14 encoding of the significance information and the refinement information generated for each
bit-plane.

5. The apparatus according to claim 4 further comprising means for truncating
2 the binary values to a predetermined level of accuracy.

6. A apparatus for coding the bit-planes of an array of numbers, wherein the
2 values in the array of numbers have been converted to binary, the binary values have been
truncated to a predetermined level of accuracy, and the number of bit-planes has been
4 determined based on a number having the maximum absolute value of the array of numbers,
the apparatus comprising:

6 means for generating a tree structured description of significance information for each
bit-plane of the array based on a modified quad-tree coding technique;

8 means for generating an SNR scalable encoding of the significance information for
each bit-plane by describing new branches and leaves of the tree corresponding to each bit-
10 plane in a bottom-up-depth-first manner;

means for generating an encoding of refinement information for each bit-plane; and

12 means for generating a SNR scalable description of the array by concatenating the
encoding of the significance information and the refinement information generated for each
14 bit-plane.

7. A computer coding system for an input image, the system having a sampling

2 filter which decomposes the input image into four frequency subbands and outputs a Wavelet transform, the system comprising:

an encoder which generates a SNR scalable description of the Wavelet transform by concatenating an encoding of significance information and an encoding of refinement

6 information generated for each bit-plane, wherein the encoding of the significance
information for each bit-plane is generated by describing new branches and leaves of the tree
8 corresponding to each bit-plane in a bottom-up-depth-first manner.

8. The system according to claim 7 further comprising a decoder which utilizes

2 the SNR scalable description of the Wavelet transform to produce an output image.